E2-45: Analysis of poly aromatic hydrocarbons including benzo (a) pyrene in particulate matter from vehicular exhaust emissions

J A P Mathes[1], A W J Karunasinghe[1], S Costa[1], H D Gunawardhana[2]
([1]*Environmental Tech Div, CISIR, Colombo 7,* [2]*Dept of Chemistry, Univ of Colombo, Colombo 3*)

Automobile exhaust constituents contribute significantly to air pollution in the Colombo city. These exhaust emissions are complex mixtures containing thousands of chemical compounds in particulate and gaseous phase. They are particulate matter, lead, CO, SO_2, NO_2 HC and various classes of compounds. Poly aromatic hydrocarbons (PAH) are mainly found among these classes of compounds. For example, benzo (a) pyrene (b(a)p) which is a carcinogenic compound always emitted during incomplete combustion of carbonaceous fossil fuels.

Because of the carcinogenic and mutagenic nature of these compounds, the major objective was focussed to determine their prevalence and ambient levels in urban air.

Particulate matter samples were collected on cellulose nitrate filters using high volume air samplers and were analysed for PAH using HPLC with UV detection after extracting by ultrasonic vibration.

Results indicate that the mean concentration of the 16 priority pollutant PAH compounds is about 700 ng/m^{-3} with a variation between 144 - 2200 ng/m^{-3} in air. The mean b(a)p concentration varied in a range of 6.7 - 60 ng/m^{-3} in urban air.

The presence of PAH, some of which are carcinogenic e.g. benzo(a) pyrene, in urban air at these levels cause the air to be unhealthy for humans at high traffic junctions in the city.

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